

UCRL-7750

D-1

UCRL-7750

University of California
Ernest O. Lawrence
Radiation Laboratory

RECOMMENDED CRATER NOMENCLATURE

DISTRIBUTION STATEMENT A
Approved for Public Release
Distribution Unlimited

Lovelace Foundation - Document Library
Aerospace Medicine and Biotechnology

Livermore, California

Reproduced From
Best Available Copy

20000921 138

3337

UCRL-7750
Nuclear Explosions-
Peaceful Applications, UC-35
TID-4500 (28th Ed.)

UNIVERSITY OF CALIFORNIA
Lawrence Radiation Laboratory
Livermore, California

Contract No. W-7405-eng-48

RECOMMENDED CRATER NOMENCLATURE

Spent M. Hansen
Milo D. Nordyke
Donald E. Rawson
Walter C. Sherman
Joseph L. Spruill
William L. Steinriede
John Toman

March 16, 1964

RECOMMENDED CRATER NOMENCLATURE

Spent M. Hansen,[†] Milo D. Nordyke,[†] Donald E. Rawson,[†] Walter C. Sherman,[‡] Joseph L. Spruill,[§] William L. Steinriede,[‡] John Toman[§]

A serious lack of consistency of terminology has characterized numerous articles published in recent years reporting research in the cratering field. The need for a uniform system of nomenclature to provide a common basis of expression has thus become increasingly apparent.

The system here proposed was developed as a result of conferences held at the Lawrence Radiation Laboratory in Livermore, California, and at the Atomic Energy Commission Nevada Test Site during November and December, 1963, by representatives of several organizations currently engaged in research in the nuclear cratering field.^{†,‡,§} The purpose of the conferences was to consider the problem of formulation of a unified system of crater nomenclature.

An effort has been made to formulate both notation and terminology which will have practical use in the study and representation of nuclear and high explosive craters, and which will provide a basis for an orderly expansion of the nomenclature as becomes necessary in the future.

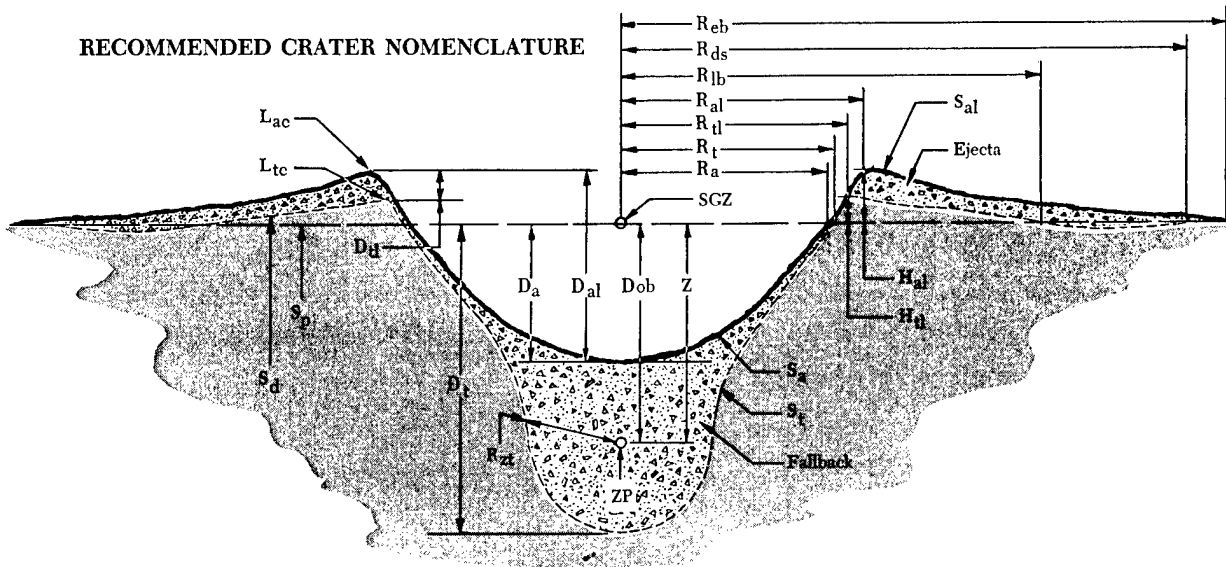
(Work done under the auspices of the U. S. Atomic Energy Commission.)

[†] Lawrence Radiation Laboratory, Livermore, California.

[‡] U. S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi.

[§] U. S. Army Engineers, Nuclear Cratering Group, Livermore, California.

RECOMMENDED CRATER NOMENCLATURE



D_a . . . Maximum depth of apparent crater below preshot ground surface measured normal to the preshot ground surface.*

D_{al} . . . Depth of apparent crater below average apparent crater lip crest elevation.

D_{ob} . . . Normal depth of burst (measured normal to preshot ground surface).

D_t . . . Maximum depth of true crater below preshot ground surface.

D_{tl} . . . Depth of true crater lip crest below apparent crater lip crest.

Ejecta . . . Material above and or beyond the true crater and includes: (1) foldback; (2) breccia—ballistic trajectory; (3) dust—aerosol transport; etc.

Fallback . . . Material fallen inside the true crater and includes: (1) slide blocks; (2) breccia and stratified fallback—ballistic trajectory; (3) dust—aerosol transport; (4) talus; etc.

H_{al} . . . Apparent crater lip crest height above preshot ground surface.

H_{tl} . . . True crater lip crest height above preshot ground surface.

L_{ac} . . . Apparent crater lip crest.

L_{tc} . . . True crater lip crest.

R_a . . . Radius of apparent crater measured on the preshot ground surface.

Note: The radius measurements pertain only to single charge craters and represent average dimensions. If crater shape deviates substantially from circular, the direction of measurement must be specified. An average radius value can also be determined by dividing the plan area by π and taking the square root.

R_{al} . . . Radius of apparent lip crest to center.

R_{ds} . . . Outer radius of displaced surface.

R_{eb} . . . Radius of outer boundary of continuous ejecta.

R_{lb} . . . Outer radius of true lip boundary.

R_t . . . Radius of true crater measured on the preshot ground surface.

R_{tl} . . . Radius of true lip crest to center.

R_{zt} . . . Distance between the zero point and the true crater surface measured in any specified direction. When measured in a direction below the zero point is equivalent to lower cavity radius.

S_a . . . Apparent crater surface, e.g. rock-air or rubble-air interface.

S_{al} . . . Apparent lip surface.

SGZ . . . Surface ground zero.

S_d . . . Displaced ground surface.

S_p . . . Preshot ground surface.

S_t . . . True crater surface, e.g. rock-air or rock rubble interface.

V_a . . . Volume of apparent crater below preshot ground surface.

V_{al} . . . Volume of apparent crater below apparent lip crest.

V_t . . . Volume of true crater below preshot ground surface.

V_{tl} . . . Volume of true crater below true crater lip crest.

Z . . . Vertical depth of burst (equivalent to D_{ob} when crater is formed on a horizontal surface).

ZP . . . Zero Point—effective center of explosion energy.

Note: The following definitions apply to linear craters only. Linear crater refers to the excavation formed by overlapping crater effects resulting from a row of charges. All above terms applicable to single craters apply also to linear craters with the exception of the radius terms which are replaced by the width terms below.

W_a . . . Width of apparent linear crater measured on the preshot ground surface.

W_{al} . . . Width of apparent lip crest measured across linear crater.

W_{ds} . . . Width of displaced surface measured across linear crater.

W_{eb} . . . Width of outer boundary of continuous ejecta measured across linear crater.

W_{lb} . . . Width of true crater outer lip boundary measured across linear crater.

W_t . . . Width of true linear crater measured on the preshot ground surface.

W_{tl} . . . Width of true linear crater lip crest measured across crater.

*All distances, unless specified otherwise, are measured parallel or perpendicular to preshot ground surface.

GLL-643-718

This report was prepared as an account of Government sponsored work. Neither the United States, nor the Commission, nor any person acting on behalf of the Commission:

- A. Makes any warranty or representation, expressed or implied, with respect to the accuracy, completeness, or usefulness of the information contained in this report, or that the use of any information, apparatus, method, or process disclosed in this report may not infringe privately owned rights; or
- B. Assumes any liabilities with respect to the use of, or for damages resulting from the use of any information, apparatus, method, or process disclosed in this report.

As used in the above, "person acting on behalf of the Commission" includes any employee or contractor of the Commission, or employee of such contractor, to the extent that such employee or contractor of the Commission, or employee of such contractor prepares, disseminates, or provides access to, any information pursuant to his employment or contract with the Commission, or his employment with such contractor.